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ABSTRACT

Several common assumptions about human intelligence are challenged in this paper. The "bucket" theory of intelligence describes intelligence as a stable psychological characteristic which affects learning, and which, when accurately measured, predicts an individual's learning capacity. The authors reject the idea that people who have high achievement necessarily do so because they are more capable than others. The human capacity myth, which perpetuates self-fulfilling prophecy, is called unreasonable because learners do not necessarily always perform up to their capacities, nor are such abilities unchanging. Alternative perspectives of learning are examined: (1) most people have equal innate neurological capacity but learn differently due to differences in skill, motivation, or knowledge; (2) people have different innate capacities, but learning differences are the result of classical conditioning or reinforcement; and (3) heredity and environment interact to influence ability, but these differences in ability, especially as measured by intelligence tests, are too narrow to account for variations in learning. An historical review of other research which has criticized the concept of fixed intelligence and intelligence testing is also included. (GDC)

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THE NATURE OF HUMAN ABILITY:

AN HISTORICAL PERSPECTIVE ON INTELLIGENCE

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THE NATURE OF HUMAN ABILITY:

AN HISTORICAL PERSPECTIVE ON INTELLIGENCE

"Intelligence" is a prominent term in any discussion of human ability. Intelligence most often refers to an individual's capacity to learn. As typically conceived, it describes a phenomenon that is measurable or systematically observable, at least in principle. Further, intelligence is most often assumed to be relatively unchanging over the course of a person's biography, except in accord with maturation across the lifespan or in instances of extreme physiological disruption or radical environmental alteration. This stems from the belief, now archaic in some circles but firmly held by others, that intelligence is largely a genetically inherited capacity. Intelligence, then, is seen as; (1) a psychological characteristic which, (2) is relevant to learning and role performance, (3) is relatively stable, (4) is subject to scientific analysis and, under certain conditions, available to observation, and (5) if accurately assessed, indicates the capacity or limits of the individual for learning.

This is not meant to deny the considerable controversy and differences in perspective which have often surrounded this topic. We are confident, however, that our statements here capture the beliefs about reality which a majority of educators, parents, and others attach to this term. Indeed, something like these ideas have dominated so much of the analysis of learning for so long that they now constitute "common sense," at least in the United States. In some circles the shorthand phrase which has emerged as a label for this set of assumptions is the "bucket" theory of intelligence.

In part, such notions do seem reasonable. We do not quarrel with the innocuous notion that people cannot learn or do more than that of which they are

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ultimately capable. Nor do we question the commonly held view that people vary in their neurologically and biologically structured capacities, that is, the genetic inheritance often thought to be the primary determinant of intelligence. We reject, however, the widely exaggerated assumption that intelligence, when conceptualized as an inherited or acquired fixed capacity, is useful for accounting for learning. That is, we reject the idea that people who perform at high intellectual levels or who forge new and valuable areas of endeavor do so simply or even primarily because they are more capable than others. At issue is the presumption that the higher one's intellectual achievements, the greater one's capacity for learning, or that the lower one's achievements, the lower one's capacity. We think this presumption is a serious mistake.

In this paper we offer a critique of what we call the human capacity myth. We first review three perspectives on the sources of learning which articulate in general terms how this activity is related to inherited and/or acquired capacities and abilities. In this discussion we note how certain beliefs about group differences have been inappropriately appended to prevailing myths about the relation of intellectual capacity to learning, and how the policies and practices surrounding learning have been influenced and legitimated by such beliefs to the detriment of large segments of the population. Our general conclusion will be that "intelligence" is a description of learned behavior patterns, rather than an explanatory notion which helps account for learning. That is, we believe that this term originated as a useful adjective but has been forced inappropriately into use as a noun. In trying to explain behavior considered intelligent, theorists have posited entities or structures in the psychological domain and reified them by developing procedures to identify and measure such constructs. The invention of a questionable noun to

replace a useful adjective -- structure rather than process -- contributed to serious problems in the scientific study of learning.

That being the case, social learning theory must explain the intelligent behavior patterns of people, rather than posit the existence of logically and empirically suspect personal properties as causal influences of learning. As a step in that direction, we articulate in this paper a conceptualization of human ability that we think is far more fruicful for the understanding of how people learn than are the assumptions about human ability contained in the human capacity myth.

The Human Capacity Myth and Alternative Perspectives

A large part of our society firmly believes that differences in learning are the direct result of intellectual capacities which are largely fixed at birth. This is a myth, unsupported by compelling evidence or logical argument, a myth which for many decades has been the cornerstone of self-fulfilling prophecies with widespread deleterious consequences for many people. Shortly, we will sketch a brief history of this human capacity myth in regard to the concept of intelligence. For now, we simply point out that in spite of long-standing scientific criticism, the human capacity myth maintains a powerful place in American beliefs, policies and practices involved with learning. Even people who disagree with the human capacity myth nonetheless often act in ways which support, perpetuate or condone various of our social institutions and personal habits which reflect this set of beliefs about the determinants of learning.

Why is it unreasonable to use presumed capacities to account for the variations in learning which people exhibit? There are four distinct perspectives or positions on this issue.

1) Differential Inherited Capacity Determining Ability

We have already sketched the first position, and now wish to examine it at some length. Here intelligence is viewed as an explanatory capacity for learning, determined to some relatively large degree by genetic inheritance and therefore relatively fixed. As documented by Robert M. W. Travers, "One powerful belief that has had influence on education is the view that humans differ fundamentally and genetically from one another in their ability to handle life situations with competence" (Travers, 1983). With its immediate origins in the socio-economic elitism of Europe, this view has been present in North America since its colonization and has dominated education since the late nineteenth century. Using this perspective, we would answer questions like "Why did Mary learn more than Jimmy?" by referring to her superior innate capacity; her gift of intelligence.

Two false implicit assumptions operate here. First, it is assumed that learners perform up to or near their capacities. In other words, postulated or supposedly measured capacities are assumed to be virtually equivalent to behavioral outcomes. Unless some valid measure of capacity is developed which utilizes indicators that are independent of behavior, such behavior -- that is, how people function in social situations like test-taking -- is all that can possibly be used as a source of information about the presumed capacity. But there is no validity check available to prove that behavior in any particular situation indicates or approximates one's capacity. Thus this untestable

assumption that learners learn at a level approaching their capacity to learn must always be based on an article of faith.

The second false assumption, consideration of which is relevant to the disproof of the first, is the belief that such capacities do not change. On the contrary, almost anyone can learn more complex skills and knowledge. Our "buckets" for learning are rarely if ever full, and we can demonstrate new "talents" under a variety of propitious conditions. We can almost always learn a good deal more than we have already learned. Evidence amassed from intelligence tests and summarized in the next section shows that I.Q. scores, as problematic as they are as indicators of intelligence, are not at all fixed over a person's lifetime. Within very broad limits posed by our species characteristics (which also change and expand over time), we can all learn to perform at higher levels or in different ways given the right circumstances. Thus behavior at any given time is more likely <u>not</u> to indicate capacity at all; and even if it did, that capacity cannot be assumed to be unchanging.

Further, there is no reason to believe that the capacities of our sensory or neurological systems limit or prevent most of us from learning more. Rather, ability is influenced by our health, our energy levels, how we feel and think about ourselves and our world, along with numerous circumstances in our environment; it is these factors rather than inherited biological features alone which combine to make a difference in what and how much we learn.

Consider the following analogy: One is not likely to conclude that the difference in speed between two new, typical automobiles, one traveling 25 miles per hour and the other 50 miles per hour on the same street, is due to a difference in each car's maximum capacity for speed (unless it is known that each driver is trying to go as fast as possible). We may discover that the car going only 25 miles per hour is capable of going 120, while the other car is

capable of only 60 miles per hour but is going 50. Thus the car with the greater capacity for speed is going more slowly and the car with the lesser capacity is going faster. In the same vein, we know that people learn rapidly or slowly -- or even fail to learn altogether -- for a variety of reasons none of which has anything to do with their intellectual capacities for learning.

Looking at the issue from another angle, most of what is considered very "smart" behavior in our society can be attained by most people given the appropriate and conducive circumstances. Numerous case histories document that many people who have been judged to be relatively "slow" or "dull" by expert psychologists and educators have, in fact, gone on to learn foreign languages or to solve difficult mathematical or scientific problems. We also know that many achievements which were once considered very complex, abstract or difficult and which were reserved only for those deemed talented -- activities like driving a car, piloting an airplane, learning algebra or conducting a valid experiment -- are now considered within the learning range of most people.

Before turning to the other three positions regarding the relation of intellectual capacity to human ability, we want to expand our discussion of the human capacity myth by focusing on the consequences of this set of beliefs. We start by returning to the analogy between explaining learning and explaining the speed of a car. Our technology for measuring a given car's capacity for speed is based on verified knowledge of physics, mechanics, chemistry and engineering, and is highly refined and reliable. In addition to the mechanical and aerodynamic characteristics of the car, a precise assessment would give attention to environmental conditions (wind, terrain, temperature, fuel, etc.) and interactions between the properties of the car and the environment. Our technology for assessing a human being's capacity to learn is woefully inadequate, however, because unsubstantiated and dogmatic hereditarian theories

of intellect have dominated crucial sectors of educational research and practice. As a result of belief in the human capacity myth, immense effort has been misspent in the attempt to identify the capacities posited by this aspect of our dominant educational ideology. The human capacity myth has led some influential educational researchers to invent "scientific" measures that produce "data" predestined to support the theory of a genetically fixed intelligence. Simultaneously, a great deal of evidence that could have led to a more accurate understanding of learning has been ignored until relatively recently. The human capacity myth has also led psychometricians largely to exclude from attempted measures of learning capacity any assessments of the environmental circumstances of learners.

Nonetheless, many people make a living from the mistaken assumption that not only is our capacity to learn an important determinant of what and how much we learn, but that this capacity is measurable using so-called intelligence tests. Publishers and a wide variety of professionals in our society are paid to develop, administer, interpret and teach others about such measurement procedures, and to apply the "knowledge" gained about learners to the practices of the school or other setting of learning.

The human capacity myth also influences the formal organization of our educational systems. Most of our curricula planning assumes at least implicitly that the "bucket" theory is valid. In part because most people have faith in such theories, or simply take them for granted, our schools are organized as they are and thereby low quality educations are provided for some students and higher quality educations for others.

Consider the currently popular belief in so-called "learning disabilities," for example. A learning disability is usually presumed to exist when low levels of learning are noted in a subject matter area (such as reading)

at the same time that a higher level of performance is observed on an I.Q. test. Many educational practitioners and parents still believe that such tests measure fixed intellectual capacity; the I.Q. scores resulting from these tests are assumed to be resistant to change, not dependent upon prior learning, and not affected by situational factors; as we shall see, none of these assumptions about I.Q. is supported by research.

Yet the belief in the human capacity myth dictates that "underachievers" be analyzed for the source of their "less than expected" performance, which in some cases is labeled a "disability." Disabilities require specialized attention; both the disability and the consequent attention it receives are given special meanings by everyone involved, and not all such meanings are beneficial to student learning or personal growth. If "intelligence" -- at least as measured by I.Q. tests -- were to be viewed as being influenced by prior learning and therefore subject to change, then the field of learning disabilities would be characterized by somewhat different principles; altered intervention strategies would be fostered, and the meanings engendered by certain learning difficulties might be quite different. Similar analyses could be applied to both the tracking programs prescribed for groups of learners thought to have the capacity for college versus non-college bound curricula, and the special programs for so-called gifted and talented students.

In addition to organizational and programmatic features of our system of formal education, the more informal ways in which parents, teachers and managers socially relate to their offspring, students and employees are also pervasively shaped by the human capacity myth. The belief is widespread throughout our culture that individuals are permanently limited to some specific level of ability. Hence, only those whose biographies happen to contain the mix and synthesis of biological, psychological and socio-environmental factors conducive

to high levels of learning will in fact learn at high levels. One of the most insidious features of the human capacity myth is its power to mold self-fulfilling prophecies that limit rather than enhance learning. Research has shown that when parents or teachers (Brookover, 1965) can be experimentally induced to alter their beliefs and expectations about the limitations of their children or students, higher levels of school learning occur. Impressively, these studies involved no direct experimental improvements of curriculum, teaching style, educational materials, peer group relationships or any of the many other factors known to have an impact on learning.

Broadening the focus of our discussion, when differences in learning are attributed to differences in innately determined factors, we frequently also find that such traits are associated in people's minds with differences in gender, race or ethnic group status. Yet the relationships between these status characteristics and intelligence are seldom clearly examined. Such concepts as "cultural deprivation," "cultural deficits," the "culturally different" and "educationally disadvantaged" provide relevant examples. The presumed conditions associated with these various cultural concept are given much greater weight than they deserve as perceived causes of students' learning. Since the "re-discovery" of poverty in the early 1960's, along with a great deal of social scientific and journalistic effort to publicize the deleterious effects and correlates of poverty, racism, "classism" and the like, glib over-generalizations have become prevalent which short-circuit thinking about the determinants of learning among the poor and various minority groups.

There are many children of poor parents who are not educationally disadvantaged in any pedagogical sense, and there are many from wealthy homes with serious intellectual disadvantages. Yet in the United States the criterion for individuals being labeled "educationally disadvantaged" involves being

labeled economically poor without any reference to actual academic or learning deficits. In the case of Head Start, no information on academic impairment or skill is used in determining which particular students are "educationally disadvantaged." The criteria for Title I and Head Start programs for the disadvantaged involve simple family income conditions.

Referring unquestioningly to the poor as educationally disadvantaged is specious at the very least, and in many cases stereotypically damaging. In their worst light, such policies treat the poor as generally lacking in learning capacity, as mere creatures of "the culture of poverty;" these policies carry the implication that the poor lack wealth simply because they are not able to learn.

Of course there are many educators and others who recognize that socio-cultural origins can influence learning at home and school. Yet some of these people still actively perpetuate educational practices consistent with the human capacity myth. Such individuals contradict themselves by supporting or condoning programs like tracking or intelligence testing which are based on the implicit belief that apparent differences in learning are due to differences in talents or intelligence, which in turn are related to race, socio-economic status or ethnicity. Such a paradoxical and illogical mix of mythology and over-generalization produces dire and unfortunate results in the lives of many people, unnecessarily limiting not only learning, but life chances and less tangible satisfactions as well.

If differences in learning cannot be attributed to differences in capacity, then how can learning be better understood? Are any of the other three perspectives more consistent with existing evidence? Do they avoid the objectionable consequences of the human capacity myth?

2) Equal Inherited Capacity with Environment Determining Ability

The second perspective presumes that most people are initially and essentially equal in innate neurological capacity but that they acquire different knowledge, skills and motivation; all or nearly all of the differences in learning are due to differences in skill, motivation or knowledge which have been established through learning. This view, brought to North America by the Puritans, was the basis for the Common School prominent in American public education until the late nineteenth century. The Puritans believed "that all human beings had the same inherent capacities, though they might differ in the extent to which they felt moral obligation to use the capacities that God had given them" (Travers, 1983).

3) Differential Inherited Capacity with Environment Determining Ability

The third perspective differs by asserting that there are differences in capacities but, like the second position, believes that nearly all differences in learning are best understood as the consequence of environmental influences, either as classical conditioning or as learning shaped by rewards and punishments. This view was established within psychology by Edward L. Thorndike and later elaborated and popularized by Watson, Hull, Tollman, Skinner and others (Travers, 1983). While this modern behaviorist view seems to directly contradict the human capacity myth, and has gained considerable influence in this century, by no means has it displaced the genetically determined capacity model.

As one major source of criticism of the bucket theory of intelligence, for example, this third position has fostered considerable skepticism of the use of standardized I.Q. tests as measures of a fixed capacity. Yet the testing,

categorizing and stigmatizing of learners by educators, parents and peers has continued. Frequently one hears "I know there are problems with the tests ... but if they are used correctly they can be helpful." The implication is that I.Q. tests be disavowed as measures of inherited capacity, but be treated as valid measures of current levels of acquired "learning ability." "Correct use" of such tests means to view them as diagnostic devices to isolate areas in which reinforcement histories have led to insufficient learning in particular ways.

This is a weak apologia for several reasons. First, the sub-tests of many I.Q. tests are not specific enough for adequate diagnostic use in most cases; assessment devices abound which have been fine-tuned specifically for diagnosing particular aspects of the learning process. Second, I.Q. scores are still computed and recorded, affixed to learners' records and therefore capable of influencing the perceptions of future teachers or others who might construct, hold, and communicate expectations to the learner which limit or impede learning. An educator or parent has little control over the beliefs which others communicate to their students or children. Given the power and persistence of the human capacity myth, decisions can be made and processes invoked which adversely affect learners' assignment to a curricular track, occupational guidance, decisions about scholarships, counseling regarding higher education and a host of other processes which can be influenced irrationally. Finally, no matter how much theoretical insight behaviorism offers to its adherents, the I.Q. score remains a symbol of past performance, with the lingering connotation of "capacity" lurking on the edges of awareness.

Like the human capacity myth, these two varieties of extreme environmental determinism are difficult for us to accept. Both explanations are clearly at odds with the concept of a fixed and genetically determined capacity to learn. But the assertion that most people are initially equal in their

capacities for learning is not verifiable to everyone's satisfaction at this time; nor are the views that "capacities" vary, or that they are fixed and genetically determined. Nevertheless, we have increasing evidence that one's neurological structures are important to learning, as well as one's energy levels, beliefs, feelings and health; and beyond doubt, the relevance of environmental conditions for learning is well established. However, as is the case with biological or psychological determinism, we do not have the evidence to claim that learning is totally determined by the environment. In our model and theory of social learning we attempt to take all of these factors appropriately into account, to the extent and in the manner indicated by sound research. This is why we favor a fourth position.

4) Inherited Capacity Interacting with Environment Determining Ability

The fourth general perspective for learning does not rest on the same kinds of untestable assumptions as do the first three analyses. It holds that there may be differences in the individual's capacity to demonstrate certain types of intellectual activity which are due to heredity, due to environment or due to the combined forces of heredity and environment; yet such differences in capacity, especially when assessed by so-called intelligence or aptitude tests, are largely irrelevant for explaining most of the variations we see in human learning. This fourth position suggests that we need more precise information from studies of neurology and genetics, and this knowledge needs to be coupled with our understandings of other forces within the individual and the relevant conditions of the environment which interact with such properties of the individual.

This fourth view emphasizes that human ability is a term denoting much more than that which is conveyed by the idea of capacity. "Ability" denotes that one has all of the necessary individual characteristics or qualities for accomplishing a particular learning activity. This would include health and energy, beliefs about self and world, environmental constraints and resources, and the interactions between and among all these factors. "Capacity" as a term is much too limited in meaning because of its emphasis on and its connotations about one's limitations; it focuses attention on quantities of knowledge or skill that can be somehow received or held. From our frame of reference, "intelligence" displayed by individuals is viewed as a description of ability rather than capacity. Intelligent behavior may be limited by various capacities, but it is not the same as capacity nor is it adequately explained by capacity. This, in our thinking, is a useful view because it shifts our attention toward the identification of all the significant and interacting forces involved in human learned performances that come to be interpreted by others as "able." Human ability per se -- of which capacity is but one rather limited aspect -- becomes the important focus, rather than capacity alone.

HUMAN CAPACITY: A BRIEF HISTORY

The mainstream view of human intelligence is the conceptual foundation for the human capacity myth. Our analysis of human ability leads to a rejection of this view. Of course, we are not alone in our negative appraisal of the concept of fixed intelligence and its quantification. Many others have documented, in more detail than we shall here, the debilitating scientific

weaknesses and the objectionable ethics and politics involved in this area of educational research and practice.

In this section, we summarize some of these criticisms, attempting to be brief since the story has been told before. But re-telling is in order, since many parents, educators, vocational training experts, counselors, managers, and behavioral and social scientists are not aware of how the human capacity myth has been legitimated by scientific research that is rife with flaws, nor of the many telling criticisms from the scientific community which have been voiced from the very beginning of the intelligence testing era.

In general, the history of scientific work on intelligence reveals a pattern where conceptual and methodological innovations have functioned to produce evidence which conforms to prior theoretical commitments to the human capacity myth. Some innovations, like factor analysis, were invented precisely for that purpose (Gould, 1981). Once favorable "scientific data" are obtained, the theory of genetically fixed learning capacity is confirmed, and popular common sense beliefs along the same lines -- however simplified or ideological -- are reaffirmed as well. In this fashion, cultural themes mold scientific theories; scientists' commitments to their theories shape the development of measuring devices employed to gather supporting evidence; and such evidence in turn rebounds to confirm the cultural beliefs.

We certainly do not intend to single out psychology as a scapegoat for social or educational problems, or as a bastion of scientific errors. Such reciprocal relationships between cultural values and scientific knowledge exist in all areas of physical and social science. The intelligence testing movement, while prominent within the discipline, obviously was only part of the field of psychology. Indeed, many of the most telling criticisms have originated from within psychology. Interestingly, many of the leading researchers who refined

and proselytized the human capacity myth, like Goddard, Termin, Yerkes, Brigham, Boring and others, later either recanted their views or toned down their degree of dogmatic adherence to the human capacity myth. Yet by then the damage had been done; intelligence testing and the belief in inherited intelligence had become institutionalized.

The theory of intelligence which emerged during the mid- and late-industrializing era in England and the United States fit almost perfectly into the cultural and economic trends of these societies. Opinion leaders, especially corporate and political, were emotionally and intellectually committed to social Darwinist and laissez-faire doctrines. Many aspects of the popular ideology supported these views, as did many leading intellectuals. From the perspective of the present, it seems clear that earlier critics within and outside of psychology were unable to alter this fallacy-filled science of intelligence and learning due to the intricate fit between social policies, flawed scientific work and broad cultural values.

In the years following the publication of Charles Darwin's account of biological evolution, the notion that biological factors influence human affairs became scientifically credible. The popularity of Darwin's work among intellectuals gave rise to analyses of the human condition which portrayed biological properties as dominant causes of individual and group differences not only in appearance, but in behavior patterns and social achievements as well. Francis Galton, Darwin's cousin, was an early student of genetic inheritance and individual differences. His efforts starting in 1882 to measure biological characteristics thought to be related to intellectual functioning largely initiated the early intelligence testing movement. This movement spread to Germany, the United States and elsewhere during the 1890's.

In Germany, under the influence of Wilhelm Wundt, early psychological research emphasized physiological measurement. James McKeen Cattell, an American studying under Wundt, had arrived at conclusions similar to Galton's views, and had written his doctoral dissertation on individual differences. Cattell coined the term "mental test," and initiated a research program in the United States reflecting Galton's perspective on measuring a genetically fixed property of individuals. Numerous tests were developed in the United States and Europe throughout the 1890's which emphasized anthropometric and physiological measures, sensory functions, memory, reaction times and the like. These tests eventually grew unpopular because researchers were unable to show that they were internally consistent or that they were related to school performance.

In contrast to Cattell's and Galton's approach, certain French authors had argued much earlier for the importance of higher mental processes and linguistic performances as indicators of intellectual functioning. Since the discovery and observation of a socially isolated child at the turn of the 19th century, French medical and educational interest had been directed to the nature of mental deficiency. A number of schools for the mentally retarded were established in France and elsewhere, and French officials eventually attempted to bring coherence to the admission policies of these schools. A study commissioned in 1904 authorized the development of a test for use in determining which children were to be placed in educational programs for the "mentally deficient." Alfred Binet was placed in charge of developing such a test.

Thus Binet's famous "intelligence" test of 1905 was an early attempt at a diagnostic instrument for screening problem learners, and was never intended for the quantification of individual differences in intelligence among "able-minded" learners. Binet generally opposed the conceptualization of intelligence as a

unified psychological ability, as well as the use of tests to measure such a notion.

Binet's 1905 test was translated into English and brought to the United States by H. H. Goddard, a research director at a New Jersey school for the "feeble-minded." Later in his career Goddard moderated his views, coming to oppose the segregation of the "feeble-minded" and arguing that they were not incurable. Yet the popularity of using intelligence tests to identify and label learners as permanently limited in ability had been established.

In the second decade of this century, Lewis Termin of Stanford University incorporated Binet's work into the British and American interests in intelligence testing, working within the by now well established doctrine of a genetically fixed learning capacity. Thus, Termin's work capped the transition from the French pragmatic and policy-oriented interests in diagnostic devices to the earliest form of the modern intelligence test.

Termin extended the length of Binet's test, and applied it to adults as well as children and adolescents. He argued for administering such tests to all students rather than only candidates for special attention. Perhaps most importantly, Termin paved the way for group testing via paper and pencil tests, rather than individually administered intelligence tests composed of a variety of tasks.

The administration of intelligence tests to 1.75 million recruits during World War I set a precedent for their mass use. In just a few years, paper and pencil intelligence tests for use in schools were marketed widely. Leading psychologists like Termin, Thorndike and Yerkes participated in the development and marketing of such tests after World War I.

Since Termin's early work, intelligence tests have been developed through item selection techniques, standardization procedures, and various statistical

concepts and methods for analyzing test results. Many of these techniques have been applied in ways appropriate to measurement theory, while at other times they were not. In general these various techniques have been used to confirm preordained assumptions about; (1) the unitary nature of intelligence, (2) its stability, i.e., fixed nature, and (3) its origins in genetic inheritance.

Intelligence as Unitary?

Intelligence tests, like other measures of theoretically unitary or one-dimensional constructs, were developed according to measuring principles intended to lead to a measure of a single phenomenon. Yet statistical procedures designed for the purpose of discovering the number of factors measured by such tests have not always revealed the theoretically desired results. Esoteric debate over what intelligence tests measure, involving increasingly complex analytic procedures and interpretations, have marked the history of intelligence testing. Many argue that intelligence is indeed a unitary phenomenon (symbolized by Spearman as "g" for general ability) and that I.Q. tests primarily measure a single thing, even though each test seems to tap some specific abilities unique to a given test. Others find a number of relatively independent factors being measured by the tests, perhaps bound together by a "second-order" factor underlying the multiplicity of intellectual dimensions they think are measured by I.Q. tests. Still others believe the tests measure many virtually unrelated abilities. In the final analysis, never have the single-factor adherents published statistical results that would satisfy the criteria of scientists from other fields dealing with analogous problems. Further, never have single-factor adherents convinced the community of scholars specializing in psychological measurement that their conclusion is valid. In spite of this, their claims about the truth of the human capacity

myth have largely held the day. In effect, the myth was popularized and institutionalized before the evidence was in. Since then, inertia and vested interest have been on the side of the fallacy. "Intelligence" has not only never been proved to be a unitary thing, it has never been proved to be a thing at all. It is an artifact of tests and widely held false assumptions.

Intelligence as Fixed?

Intelligence testers have also been unable to offer convincing evidence that I.Q.'s do not vary over time. Early tests revealed that an age group's average I.Q. would change as the members grew older. For example, school-related items were blended with home-related items in such a manner that the calculated I.Q.'s of children showed a gradual increase with age throughout the years of transition from home to school. Yet in spite of this manipulation, children's pre-school I.Q. scores are very poor predictors of their in-school I.Q. scores. The phenomena measured by pre-school intelligence tests are evidently different from that measured by in-school tests of the same name.

Also in contradiction to the human capacity myth and the best efforts of intelligence testers, "mental age" does not keep pace with chronological age after about the age of 16 or 18 years. Not only does measured intelligence change in the cases of many individuals, but experiments have repeatedly shown that situational factors directly influence I.Q. scores. Anxiety or stress in testing situations affect performance on many types of tests, including intelligence tests. Moreover, status characteristics of the test administrator influence test-takers performances, as do the test-takers perception of how the test results will be used. For example, blacks score better when the test administrator is black rather than white, and when blacks were told their scores were going to be compared to whites they scored lower than when told they

would be compared with blacks. Research demonstrating these situational influences started accumulating in the 1930's and has now become a sizable literature yet the implications of this literature have been largely ignored.

Intelligence as Inherited?

Efforts to prove that intelligence is inherited largely rest on two interrelated sources: statistical estimates of heretibility of measured intelligence across generations, and "natural experiments" with subjects related by blood, especially separated identical twins. Statistical formulae representing the heretibility of a trait would seem to require far better measurements than have been established to date by intelligence testing. Detailed, item-by-item perusals of a wide variety of intelligence tests reveal a shocking frequency of straight-forward errors of fact or logic, as well as considerable cultural and social class bias in the semantic content of the test items (Houts, 1977).

Statistical estimates of heretibility of I.Q. scores only stand as proxies for biological research on the genetic basis of human intelligence. As currently defined within the human capacity myth, molecular biologists and biochemists would seem to have no clear basis for identifying a genetic base. The empirical manifestation of "intelligence" must be more clearly specified before genetic researchers will be in a position to see if some set of genes are the chromosomal origin of intelligence, if and when viable assessment techniques become available. We feel that as things stand now, the faulty conceptualization of intelligence makes this an impossible task.

The Changing Cultural Context and the Concept of Intelligence

The human capacity myth was integrated into American culture and maintained its powerful position for several reasons. Most relate to the cultural context in which this myth developed. These reasons include: the sponsorship of the myth by leading intellectuals; the relative ease of adopting the myth into our educational system; the vested interests of the testing industry and important segments of the educational establishment; industrial society's need for the appearance of impartiality in the process of social selection within schools and the job market; and the myth's role in rationalizing racism, the reproduction of social class differences, and other forms of contradictions between expressed values (such as equality), and readily apparent inconsistencies with those values.

Perhaps by now the cultural context so powerfully involved in the manufacture and institutionalization of the human capacity myth has changed to the point where more useful understandings will take its place. It seems clear the intelligence understood as capacity to learn is simply an inadequate -- indeed, extremely harmful -- way to understand individual differences.

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